REMARKS

This is a full and timely response to the outstanding non-final Office Action mailed September 4, 2003 (Paper No. 15). Claims 17-55 are pending in the application. More specifically, claims 17, 36, 37, 41, 42, 45, 46, 52, and 53 are directly amended. Reconsideration and allowance of the application and presently pending claims 17-55 are respectfully requested.

I. Response to Restriction/Election

Applicants wish to express their sincere appreciation that the Examiner agrees with Applicants to examine claims 17-55 together.

II. Response to Claim Rejections Under 35 U.S.C. §103

In the Office Action, claims 17-19, 22-23, 26-28, and 32-33 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 6,078,619, to *Monro, et al.* Claims 20-21, 24-25, 29-31, and 34-35 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Monro* as applied to claims 17, 22, 26, and 32, and further in view of U.S. Patent No. 6,415,055, to *Kato*. Further claims 36-55 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Monro* in view of *Kato*.

A. Claim 17

Claim 17 recites the feature of "a first object-oriented coder that ... assigns a higher number of error control overhead bits to the object macroblocks than to the background macroblocks." In rejecting claim 17, the Office Action alleged that *Monro* discloses "means for assigning/allocating (42) a higher number of bits to the object macroblocks than to the background macroblocks (column 5, lines 30-37; column 6, lines 7-11)" (page 2 of the Office Action). The Office Action further alleges that *Monro* "discloses providing some level of error protection (col. 6, lines 49-54) and error thresholds in rate buffering and the object separator modules for limiting the effects of camera noise (col. 7, lines 20-22)" (page 2 of the Office Action). Based on the premises that the Office Action provided above, the Examiner concluded that it would have been obvious "to assign a higher number of error control overhead bits to the object macroblocks than to the background macroblocks, since the object macroblocks have been assigned a higher number of bits, thereby

having a greater chance of sustaining more errors than the lower bits assigned background macroblocks" (page 3 of the Office Action).

1. Error Protection

Monro discloses that the *Monro* system can use a packet switched network as a transmission medium (col. 3, lines 48-52). Further *Monro* discloses in col. 6, lines 49-54 the following:

> "In one version of the system, as shown in FIG. 1, once the compression stage has been completed, the quadtree and compressed data for each tile are 'packetized' to provide some level of error protection. This allows for some of the transmitted data to be corrupted, and for the system to remain in a synchronised state.
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> There are of course many ways in which the individual blocks may be sorted into priority order, and transmitted. Depending upon application, the information could be sent on a tile by tile basis, with the quadtree structure along with the corresponding data being packetized and sent just for an individual tile."

(Emphasis Added)

The Communication Handbook, Gibson 1997, page 426, defines packet switching as the following:

> "In packet switching, messages are divided into segments or packets. These packets may be transmitted over different selected channels in a network. Each packet contains address information as well as other information regarding message treatment. Contention occurs for each packet at each switch. Most applications using packet switching are, traditionally at least, one and not necessarily in real time; packets may be stored and delayed until the contention is resolved or the switch runs out of storage capacity. The memory used to store the packets is, for packet switching, the equivalent of the switching fabrics."

Monro further discloses that "the system is arranged to re-send (replace) each of the tiles 30 in a pseudo random sequence, whether or not the system considers such re-sending to be necessary. This is useful, particularly in lossy environments, to compensate for possible errors in the previous sending of one or more tiles" (col. 7, lines 38-42). Accordingly, Applicants respectfully assert that the *Monro* error protection using packets is not the claimed feature of "a first object-oriented coder that ... assigns a higher number of error control overhead bits to the object macroblocks than to the background macroblocks a higher number of error control overhead bits to the object macroblocks than to the background macroblocks", as recited in claim

17. Therefore, a prima facia case establishing an obviousness rejection over *Monro* has not been made. For at least this reason alone, Applicants respectfully submit that claim 17 be allowed and the rejection be withdrawn.

2. Error Thresholds

Monro discloses "error thresholds in both the rate buffering and the object separator modules to limit the effect of camera noise" (column 7, lines 20-24 of *Monro*). *Monro* further discloses "[a] rate buffering system limits the bandwidth by transmitting only the foreground blocks which most improve the image and are above some error threshold" (Emphasis Added, Abstract of *Monro*). In addition, "the purposed of [the object separator] is to separate out from the image a background object and a foreground object" (col. 4, lines 63-65).

Accordingly, Applicants respectfully assert that the *Monro* error thresholds is not the claimed feature of "a first object-oriented coder that … assigns a higher number of error control overhead bits to the object macroblocks than to the background macroblocks a higher number of error control overhead bits to the object macroblocks than to the background macroblocks", as recited in claim 17. Thus, Applicants respectfully submit that *Monro* fails to teach, disclose or suggest at least the feature of "a first object-oriented coder that … assigns a higher number of error control overhead bits to the object macroblocks than to the background macroblocks", as recited in claim 17. Therefore, a prima facie case establishing an obviousness rejection over *Monro* has not been made. Accordingly, for at least this reason alone, Applicants respectfully submit that claim 17 be allowed and the rejection be withdrawn.

B. Claims 22, 26, and 32

Claims 22 and 32 recite the feature of "assigning a higher number of error control overhead bits to the object macroblocks than to the background macroblocks." Claim 26 recites the feature of "means for allocating a higher number of error control overhead bits to the object macroblocks than to the background macroblocks."

In rejecting claims 22, 26, and 32, the Office Action alleged that *Monro* discloses "means for assigning/allocating (42) a higher number of bits to the object macroblocks than to the background macroblocks (column 5, lines 30-37; column 6, lines 7-11)" (page 2 of the Office

Action). The Office Action further alleges that *Monro* "discloses providing some level of error protection (col. 6, lines 49-54) and error thresholds in rate buffering and the object separator modules for limiting the effects of camera noise (col. 7, lines 20-22)" (page 2 of the Office Action). Based on the premises that the Office Action provided above, the Examiner concluded that it would have been "obvious to assign a higher number of error control overhead bits to the object macroblocks than to the background macroblocks, since the object macroblocks have been assigned a higher number of bits, thereby having a greater chance of sustaining more errors than the lower bits assigned background macroblocks" (page 3 of the Office Action).

1. Error Protection

Monro discloses that the *Monro* system can use a packet switched network as a transmission medium (col. 3, lines 48-52). Further *Monro* discloses in col. 6, lines 49-54 the following:

> "In one version of the system, as shown in FIG. 1, once the compression stage has been completed, the quadtree and compressed data for each tile are '<u>packetized</u>' to provide some level of error protection. This allows for some of the transmitted data to be corrupted, and for the system to remain in a synchronised state.
>
> There are of course many ways in which the individual blocks may be sorted into priority order, and transmitted. Depending upon application, the information could be sent on a tile by tile basis, with the quadtree structure along with the corresponding data being <u>packetized</u> and sent just for an individual tile."

(Emphasis Added)

The Communication Handbook, Gibson 1997, page 426, defines packet switching as the following:

> "In packet switching, messages are divided into segments or packets. These packets may be transmitted over different selected channels in a network. Each packet contains address information as well as other information regarding message treatment. Contention occurs for each packet at each switch. Most applications using packet switching are, traditionally at least, one and not necessarily in real time; packets may be stored and delayed until the contention is resolved or the switch runs out of storage capacity. The memory used to store the packets is, for packet switching, the equivalent of the switching fabrics."

Monro further discloses that "the system is arranged to re-send (replace) each of the tiles 30 in a pseudo random sequence, whether or not the system considers such re-sending to be

necessary. This is useful, particularly in lossy environments, to compensate for possible errors in the previous sending of one or more tiles" (col. 7, lines 38-42). Accordingly, Applicants respectfully assert that the *Monro* error protection using packets is not the claimed feature of "assigning a higher number of error control overhead bits to the object macroblocks than to the background macroblocks", as recited in claims 22 and 32, and "means for allocating a higher number of error control overhead bits to the object macroblocks than to the background macroblocks", as recited in claim 26. Therefore, a prima facie case establishing an obviousness rejection over *Monro* has not been made. For at least this reason alone, Applicants respectfully submit that claims 22, 26, and 32 be allowed and the rejection be withdrawn.

2. Error Thresholds

Monro discloses "error thresholds in both the rate buffering and the object separator modules to limit the effect of camera noise" (column 7, lines 20-24 of *Monro*). *Monro* further discloses "[a] rate buffering system limits the bandwidth by transmitting only the foreground blocks which most improve the image and are <u>above some error threshold</u>" (Emphasis Added, Abstract of *Monro*). In addition, "the purposed of [the object separator] is to separate out from the image a background object and a foreground object" (col. 4, lines 63-65).

Accordingly, Applicants respectfully assert that the *Monro* does not teach an error threshold that assigns or allocates a higher number of error control overhead bits to the object macroblocks than to the background macroblocks. Thus, Applicants respectfully submit that *Monro* fails to teach, disclose or suggest at least the feature of "assigning a higher number of error control overhead bits to the object macroblocks than to the background macroblocks", as recited in claims 22 and 32, and "means for allocating a higher number of error control overhead bits to the object macroblocks than to the background macroblocks", as recited in claim 26. Therefore, a prima facie case establishing an obviousness rejection over *Monro* has not been made. Accordingly, for at least this reason alone, Applicants respectfully submit that claims 22, 26, and 32 be allowed and the rejection be withdrawn.

C. Claims 18, 19, 23, 27, 28, and 33

Because independent claims 17, 22, 26, and 32 are allowable over the cited art of record, dependent claims 18, 19, 23, 27, 28, and 33 are allowable as a matter of law for at least the reason that dependent claims 18, 19, 23, 27, 28, and 33 contain all the features and elements of their respective independent base claim. *See, e.g., In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988). Accordingly, Applicants respectfully request that the rejection to dependent 18, 19, 23, 27, 28, and 33 be withdrawn for this reason alone.

D. Claims 20-21, 24-25, 29-31, and 34-35

In rejecting claims 20-21, 24-25, 29-31, and 34-35, the Office Action alleged that *Monro* fails to disclose an object-oriented coder that receives a location vector and at least one motion vector of an object macroblock in a previous frame, the location vector and the at least one motion vector of an object macroblock that is missing in a current frame, and replacing the object macroblock that is missing in the current frame with the object macroblock in the previous frame. In this regard, the Office Action uses *Kato* to allegedly teach, disclose or suggest the element defined in claims 20-21, 24-25, 29-31, and 34-35 that *Monro* fails to disclose.

However, claims 20-21, 24-25, 29-31, and 34-35 depend directly or indirectly on independent claims 17, 22, 26, and 32, respectively. As mentioned above with reference to independent claims 17, 22, 26, and 32, *Monro* fails to teach, disclose and suggest each and every element of claims 17, 22, 26, and 32. Applicants respectfully submit that *Kato* does not remedy the failure of *Monro*. Thus, Applicants respectfully request that the rejection to dependent claims 20-21, 24-25, 29-31, and 34-35 be withdrawn.

E. Claims 36, 41, 45, and 52

Applicants have amended claims 36, 41, 45, and 52 to include the feature of claims 37, 42, 46, and 53, respectively, and thus, claims 36, 41, 45, and 52 include the feature that assigns "a quantization factor a value that provides for receiving more location vectors and motion vectors of an object macroblock". Therefore, Applicants will be addressing the rejection to claims 36, 41, 45, and 52 in view of the rejection to claims 37, 42, 46, and 53. In rejecting

claims 36, 41, 45, and 52, the Office Action alleges that *Monro* and *Kato* discloses each and every feature of the claims. In rejecting claims 37, 42, 46, and 53, the Office Action alleges that *Kato* teaches a quantization factor for receiving more location vectors and motion vectors. However, Applicants respectfully submit that *Monro* and *Kato* fail to teach, disclose or suggest the feature mentioned above in claims 36, 41, 45, and 52.

In fact, *Kato* apparently discloses a quantization circuit 13 that quantizes a discrete cosine transform (DCT) coefficient "with a quantization scale (quantization step) corresponding to the data stored quantity (buffered stored quantity) of a second-stage transmission buffer 14 and then is sent to a variable length coding circuit 15" (column 11, lines 42-50 of *Kato*). In addition, *Kato* discloses the use of the quantization circuit 13 as follows:

> "The transmission buffer 14 temporarily stores the data, input by the aforementioned variable length coding circuit 15, and feeds data corresponding to this stored quantity back to the quantization circuit 13 as a quantization control signal. That is, if the remaining quantity of the data storage increases up to an allowable upper limit value, the transmission buffer 14 will increase the quantization scale of the aforementioned quantization circuit 13 by the quantization control signal so that the data quantity of the quantity data is reduced. Also, if the remaining quantity of the data storage reduces to an allowable lower limit value, the transmission buffer 14 will reduce the quantization scale of the quantization circuit 13 by the quantization control signal so that the data quantity of the quantity data is increased. In this way, the overflow or underflow of the transmission buffer 14 is prevented. The data stored in the transmission buffer 14 is read out at a predetermined timing and is output through an output terminal 21 to a transmission path.
>
> On the other hand, the picture data of the I-picture, output by the quantization circuit 13, is input to an inverse quantization circuit 16. In the inverse quantization circuit 16, the picture data is inverse-quantized with the information of the quantization scale supplied by the quantization circuit 13. An output of the inverse quantization circuit 16 is input to an inverse discrete cosine transform (IDCT) circuit 17 and is processed by inverse discrete cosine transform. The processed data is then supplied to and stored in a past reference picture storing section 19A of a frame memory 19 through an arithmetic unit 18."

(col. 11, line 63 – col. 12, line 24)

According, Applicants respectfully assert that *Kato* does not disclose assigning a value to the quantization circuit 13 that provides for receiving location and motion vectors of the object macroblock. Thus, Applicants respectfully submit that *Kato* fails to teach, disclose or suggest at least the feature that assigns "a quantization factor a value that provides for receiving more

location vectors and motion vectors of an object macroblock", as recited in claims 36, 41, 45, and 52. Accordingly, a prima facie case establishing an obviousness rejection over *Monro* in view of *Kato* has not been made. Thus, claims 36, 41, 45, and 52 are not obvious under the proposed combination *Monro* in view of *Kato* and so, for this reason alone, Applicants respectfully submit that claims 36, 41, 45, and 52 be allowed and the rejection be withdrawn.

F. Claims 40, 44, 50-51, and 54

Claim 40 recites the feature of "a third object-oriented codes that assigns a higher number of error control overhead bits to the object macroblocks than to the background macroblocks." Claims 44 and 54 recite the feature of "assigning a higher number of error control overhead bits to the object macroblocks than to the background macroblocks." Claim 50 recites the feature of "means for allocating a higher number of error control overhead bits to the object macroblocks than to the background macroblocks."

In rejecting claims 40, 44, 50-51, and 54, the Office Action alleged that *Monro* discloses "means for assigning/allocating (42) a higher number of bits to the object macroblocks than to the background macroblocks (column 5, lines 30-37; column 6, lines 7-11)" (page 2 of the Office Action). The Office Action further alleges that *Monro* "discloses providing some level of error protection (col. 6, lines 49-54) and error thresholds in rate buffering and the object separator modules for limiting the effects of camera noise (col. 7, lines 20-22)" (page 2 of the Office Action). Based on the premises that the Office Action provided above, the Examiner concluded that it would have been "obvious to assign a higher number of error control overhead bits to the object macroblocks than to the background macroblocks, since the object macroblocks have been assigned a higher number of bits, thereby having a greater chance of sustaining more errors than the lower bits assigned background macroblocks" (page 3 of the Office Action).

1. Error Protection

Monro discloses that the *Monro* system can use a packet switched network as a transmission medium (col. 3, lines 48-52). Further *Monro* discloses in col. 6, lines 49-54 the following:

> "In one version of the system, as shown in FIG. 1, once the compression stage has been completed, the quadtree and compressed data for each tile are

'packetized' to provide some level of error protection. This allows for some of the transmitted data to be corrupted, and for the system to remain in a synchronised state.

> There are of course many ways in which the individual blocks may be sorted into priority order, and transmitted. Depending upon application, the information could be sent on a tile by tile basis, with the quadtree structure along with the corresponding data being packetized and sent just for an individual tile."

(Emphasis Added)

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Monro further discloses that "the system is arranged to re-send (replace) each of the tiles 30 in a pseudo random sequence, whether or not the system considers such re-sending to be necessary. This is useful, particularly in lossy environments, to compensate for possible errors in the previous sending of one or more tiles" (col. 7, lines 38-42). Accordingly, Applicants respectfully assert that the *Monro* error protection using packets is not the claimed feature of "a third object-oriented coder that assigns a higher number of error control overhead bits to the object macroblocks than to the background macroblocks", as recited in claim 40, the feature of "assigning a higher number of error control overhead bits to the object macroblocks than to the background macroblocks", as recited in claims 44 and 54, and the feature of "means for allocating a higher number of error control overhead bits to the object macroblocks than to the background macroblocks", as recited in claim 50. Therefore, a prima facie case establishing an obviousness rejection over *Monro* has not been made. For at least this reason alone, Applicants respectfully submit that claims 40, 44, 50-51, and 54 be allowed and the rejection be withdrawn.

2. Error Thresholds

Monro discloses "error thresholds in both the rate buffering and the object separator modules to limit the effect of camera noise" (column 7, lines 20-24 of *Monro*). *Monro* further discloses "[a] rate buffering system limits the bandwidth by transmitting only the foreground blocks which most improve the image and are above some error threshold" (Emphasis Added, Abstract of *Monro*). In addition, "the purposed of [the object separator] is to separate out from the image a background object and a foreground object" (col. 4, lines 63-65).

Accordingly, Applicants respectfully assert that the *Monro* does not teach an error threshold that assigns or allocates a higher number of error control overhead bits to the object macroblocks than to the background macroblocks. Thus, Applicants respectfully submit that *Monro* fails to teach, disclose or suggest at least the feature of "a third object-oriented coder that assigns a higher number of error control overhead bits to the object macroblocks than to the background macroblocks", as recited in claim 40, the feature of "assigning a higher number of error control overhead bits to the object macroblocks than to the background macroblocks", as recited in claims 44 and 54, and the feature of "means for allocating a higher number of error control overhead bits to the object macroblocks than to the background macroblocks", as recited in claim 50. Therefore, a prima facie case establishing an obviousness rejection over *Monro* has not been made. Accordingly, for at least this reason alone, Applicants respectfully submit that claims 40, 44, 50-51, and 54 be allowed and the rejection be withdrawn.

3. Dependent Claims

In addition, because independent claims 36, 41, 45, and 52 are allowable over the cited art of record, dependent claims 40, 44, 50-51, and 54 are allowable as a matter of law for at least the reason that dependent claims 40, 44, 50-51, and 54 contain all the features and elements of their respective independent base claim. *See, e.g., In re Fine*, supra. Accordingly, Applicants respectfully request that the rejection to dependent claims 40, 44, 50-51, and 54 be withdrawn for this reason alone.

G. Claims 37, 42, 46, and 53

Claims 37, 42, 46, and 53 recite the feature of "using at least bit that was designated for the quantization value of the object and background macroblocks to represent the location and motion vectors of the object macroblock instead of the quantization value." As mentioned above with reference to claims 36, 41, 45, and 52, *Kato* apparently discloses a quantization circuit 13 that quantizes a discrete cosine transform coefficient with a quantization scale corresponding to the data storage quantity of a second-stage transmission buffer 11 and then is sent to a variable length coding circuit 15. In addition, *Kato* discloses the use of the quantization circuit 13 as follows:

> "The transmission buffer 14 temporarily stores the data, input by the aforementioned variable length coding circuit 15, and feeds data corresponding to this stored quantity back to the quantization circuit 13 as a quantization control signal. That is, if the remaining quantity of the data storage increases up to an allowable upper limit value, the transmission buffer 14 will increase the quantization scale of the aforementioned quantization circuit 13 by the quantization control signal so that the data quantity of the quantity data is reduced. Also, if the remaining quantity of the data storage reduces to an allowable lower limit value, the transmission buffer 14 will reduce the quantization scale of the quantization circuit 13 by the quantization control signal so that the data quantity of the quantity data is increased. In this way, the overflow or underflow of the transmission buffer 14 is prevented. The data stored in the transmission buffer 14 is read out at a predetermined timing and is output through an output terminal 21 to a transmission path.
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> On the other hand, the picture data of the I-picture, output by the quantization circuit 13, is input to an inverse quantization circuit 16. In the inverse quantization circuit 16, the picture data is inverse-quantized with the information of the quantization scale supplied by the quantization circuit 13. An output of the inverse quantization circuit 16 is input to an inverse discrete cosine transform (IDCT) circuit 17 and is processed by inverse discrete cosine transform. The processed data is then supplied to and stored in a past reference picture storing section 19A of a frame memory 19 through an arithmetic unit 18."

(col. 11, line 63 – col. 12, line 24)

Accordingly, Applicants respectfully submit that *Kato* does not disclose stealing bits from the quantization circuit 13 to be used to represent the location and motion vectors of the object macroblock, as defined in claims 37, 42, 46, and 53. For this reason alone, Applicants respectfully submit that claims 37, 42, 46, and 53 be allowed and the rejection be withdrawn.

In addition, because independent claims 36, 41, 45, and 52 are allowable over the cited art of record, dependent claims 37, 42, 46, and 53 are allowable as a matter of law for at least the reason that dependent claims 37, 42, 46, and 53 contain all the features and elements of their respective independent base claim. *See, e.g., In re Fine*, supra. Accordingly, Applicants respectfully request that the rejection to dependent claims 37, 42, 46, and 53 be withdrawn for this reason alone.

H. Claims 38-39, 43, 47-49, and 55

Because independent claims 36, 41, 45, and 52 are allowable over the cited art of record, dependent claims 38-39, 43, 47-49, and 55 are allowable as a matter of law for at least the reason that dependent claims 37-39, 43, 47-49, and 55 contain all the features and elements of their respective independent base claim. *See, e.g., In re Fine*, supra. Accordingly, Applicants respectfully request that the rejection to dependent claims 38-39, 43, 47-49, and 55 be withdrawn for this reason alone.

CONCLUSION

In light of the foregoing amendments and for at least the reasons set forth above, Applicant respectfully submits that all objections and/or rejections have been traversed, rendered moot, and/or accommodated, and that the now pending claims 17-55 are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned at (770) 933-9500.

Respectfully submitted,

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